

PRACTICE

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

Evaluate the exponential expression.

1) -11^0

A) 0

B) 1

C) 11

D) -1

2) $3^9 \cdot 3^4$

A) 9^{13}

B) 3^{13}

C) 9^{36}

D) 3^{36}

Simplify the exponential expression.

3) $(x^5)^{-9}$

A) $-x^{45}$

B) $-9x^{45}$

C) $-9x^5$

D) $\frac{1}{x^{45}}$

4) $(-6x^6)(-3x^3)$

A) $18x^9$

B) $-18x^9$

C) $-18x^{18}$

D) $18x^{18}$

Write the number in decimal notation.

5) 8.89×10^{-4}

A) 0.00889

B) -889,000

C) 0.000889

D) 0.0000889

Write the number in scientific notation.

6) 1,573,510

A) 1.57351×10^6

B) 1.57351×10^1

C) 1.57351×10^{-6}

D) 1.57351×10^7

Evaluate the expression or indicate that the root is not a real number.

7) $\sqrt{-100}$

A) $\frac{1}{10}$

B) 10

C) 10,000

D) not a real number

Use the product rule to simplify the expression.

8) $\sqrt{108}$

A) 18

B) $6\sqrt{3}$

C) $3\sqrt{6}$

D) 10

9) $\sqrt{75x^2}$

A) $5\sqrt{3}x$

B) $5|x|\sqrt{3}$

C) $75x$

D) $3x^2\sqrt{5}$

10) $\sqrt{9x^2} \cdot \sqrt{45x}$

A) $9x^2\sqrt{5x}$

B) $9|x|\sqrt{5}$

C) $9|x|\sqrt{5x^2}$

D) $9|x|\sqrt{5x}$

Use the quotient rule to simplify the expression.

11) $\frac{\sqrt{72x^3}}{\sqrt{2x}}$

A) $2x^2$

B) $6|x|\sqrt{2}$

C) $6|x|$

D) $\frac{6x^2}{\sqrt{2}}$

✓
Solve the problem.

- 12) The time, in seconds, that it takes an object to fall a distance d , in feet, is given by the algebraic expression $\sqrt{\frac{d}{16}}$.

Find how long it will take a ball dropped from the top of a building 38 feet tall to hit the ground. Write the answer in simplified radical form.

- A) $\frac{\sqrt{38}}{16}$ seconds B) $\frac{6\sqrt{2}}{4}$ seconds C) $\frac{6+\sqrt{2}}{4}$ seconds D) $\frac{\sqrt{38}}{4}$ seconds

Add or subtract terms whenever possible.

13) $7\sqrt{3} + 3\sqrt{75}$

- A) $-22\sqrt{3}$ B) $-2\sqrt{3}$ C) $22\sqrt{3}$ D) $10\sqrt{3}$

Rationalize the denominator.

14) $\frac{\sqrt{3}}{\sqrt{13}}$

- A) $\sqrt{39}$ B) $\frac{\sqrt{39}}{169}$ C) $\frac{\sqrt{39}}{13}$ D) $\sqrt{3}$

15) $\frac{3}{6-\sqrt{10}}$

- A) $\frac{18+3\sqrt{10}}{26}$ B) $\frac{18-3\sqrt{10}}{26}$ C) $\frac{1}{2} - \frac{3}{\sqrt{10}}$ D) $\frac{18+3\sqrt{10}}{4}$

Evaluate the radical expressions or indicate that the root is not a real number.

16) $\sqrt[4]{10,000}$

- A) 10,000 B) -10 C) 10 D) not a real number

Simplify the radical expression.

17) $\sqrt[3]{21} \cdot \sqrt[3]{9}$

- A) $3\sqrt[3]{7}$ B) $\sqrt[3]{189}$ C) $\sqrt[6]{189}$ D) $3\sqrt[3]{21}$

Evaluate the expression without using a calculator.

18) $16^{1/4}$

- A) 16 B) 2 C) 32 D) 8

19) $27^{4/3}$

- A) 243 B) 2187 C) 729 D) 81

Simplify using properties of exponents.

20) $\frac{40x^{1/3}}{8x^{3/2}}$

- A) $5x^{-7/6}$ B) $5x^{-7/9}$ C) $32x^{-1/3}$ D) $5x^{-1/3}$

Is the algebraic expression a polynomial? If it is, write the polynomial in standard form.

21) $5x^{-1} - 6 + 6x$

- A) No B) Yes; $6x + 5x^{-1} - 6$

Perform the indicated operations. Write the resulting polynomial in standard form.

22) $(6x^8 + 13x^7 - 5x^3 + 11) - (13x^8 - 8x^5 + 6x^3 - 11)$

A) $-7x^8 + 13x^7 + 8x^5 - 11x^3 + 22$

B) $7x^8 + 13x^7 + 8x^5 - 11x^3 + 22$

C) $-7x^8 + 13x^7 - 8x^5 - 11x^3 + 22$

D) $7x^8 + 13x^7 - 8x^5 - 11x^3 + 22$

Find the product.

23) $(x + 5)(x^2 - 5x + 25)$

A) $x^3 + 10x^2 + 10x + 125$

B) $x^3 - 10x^2 - 10x + 125$

C) $x^3 - 125$

D) $x^3 + 125$

24) $(2x + 5)(3x - 11)$

A) $5x^2 - 7x - 55$

B) $6x^2 - 7x - 55$

C) $5x^2 - 7x - 7$

D) $6x^2 - 7x - 7$

25) $(x - 14)^2$

A) $x + 196$

B) $x^2 + 196$

C) $x^2 - 28x + 196$

D) $196x^2 - 28x + 196$

Factor out the greatest common factor.

26) $14x^3 - 4x^2 + 10x$

A) $x(14x^2 - 4x + 10)$

B) $2(7x^3 - 2x^2 + 5x)$

C) $2x(7x^3 - 2x^2 + 5x)$

D) $2x(7x^2 - 2x + 5)$

27) $x^2(x - 10) - (x - 10)$

A) $(x - 10)(x^2 - 1)$

B) $(x^3 - 10x^2) - (x - 10)$

C) $x^2(x - 10)$

D) $(x - 10)(x^2 + 1)$

Factor by grouping.

28) $x^4 - x^3 + 7x - 7$

A) $(x^3 + 7)(x - 1)$

B) $(x^3 - 1)(x + 7)$

C) $(x^3 - 7)(x - 1)$

D) $(x^3 + 7)(7x - 1)$

Factor the trinomial, or state that the trinomial is prime.

29) $10x^2 + 23x + 12$

A) $(2x + 3)(5x + 4)$

B) $(10x + 3)(x + 4)$

C) $(2x - 3)(5x - 4)$

D) Prime

Factor the difference of two squares.

30) $49x^2 - 36$

A) $(7x + 6)(7x + 6)$

B) $(7x + 6)(7x - 6)$

C) $(7x - 6)(7x - 6)$

D) Prime

Factor a perfect square trinomial, or state that the polynomial is prime.

31) $x^2 + 12x + 36$

A) $(x + 6)^2$

B) $(x + 6)(x - 6)$

C) $(x - 6)^2$

D) Prime

Factor using the formula for the sum or difference of two cubes.

32) $27x^3 - 1$

A) $(3x + 1)(9x^2 - 3x + 1)$

B) $(3x - 1)(9x^2 + 3x + 1)$

C) $(3x - 1)(9x^2 + 1)$

D) Prime

Factor completely, or state that the polynomial is prime.

33) $x^3 - 9x + 6x^2 - 54$

A) $(x - 3)^2(x + 6)$

B) $(x + 3)(x - 3)(x + 6)$

C) $(x^2 - 9)(x + 6)$

D) Prime

A''

all numbers that must be excluded from the domain of the rational expression.

34) $\frac{x-9}{x^2-64}$

A) $x \neq 64$

B) $x \neq \frac{9}{64}$

C) $x \neq 8$

D) $x \neq 8, x \neq -8$

simplify the rational expression. Find all numbers that must be excluded from the domain of the simplified rational expression.

35) $\frac{2x+2}{10x^2+14x+4}$

A) $\frac{2x}{5x+2}, x \neq -\frac{2}{5}$

B) $\frac{2x+2}{10x^2+14x+4}, x \neq -\frac{2}{5}, x \neq -1$

C) $\frac{2x+5}{5x+14}, x \neq -\frac{14}{5}$

D) $\frac{1}{5x+2}, x \neq -\frac{2}{5}, x \neq -1$

multiply or divide as indicated.

36) $\frac{x^2+4x+4}{x^2+7x+10} \cdot \frac{x^2+5x}{x^2+6x+8}$

A) $\frac{x}{x^2+7x+10}$

B) $\frac{x}{x+4}$

C) $\frac{x^2+5x}{x+4}$

D) $\frac{1}{x+4}$

37) $\frac{(x-8)^2}{12} \div \frac{12x-96}{144}$

A) $x-8$

B) $\frac{(x-8)^3}{144}$

C) $\frac{12(x-8)^2}{12x-96}$

D) $\frac{1}{x-8}$

add or subtract as indicated.

38) $\frac{x^2-7x}{x-3} + \frac{12}{x-3}$

A) $x-4$

B) $x-3$

C) $\frac{x^2-7x+12}{x-3}$

D) $x+4$

simplify the complex rational expression.

39)

$$\frac{9 + \frac{3}{x}}{\frac{x}{4} + \frac{1}{12}}$$

A) 36

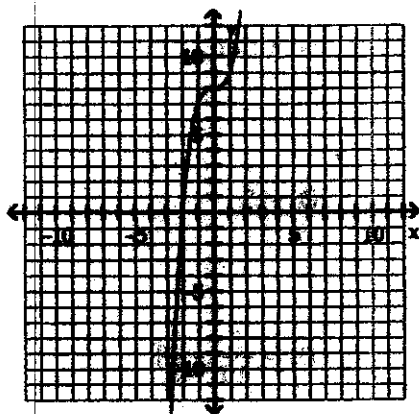
B) $\frac{x}{36}$

C) 1

D) $\frac{36}{x}$

Use the graph to determine the x- and y-intercepts.

40)



- A) x-intercept: 2; y-intercept: 8
C) x-intercept: -2; y-intercept: 8

- B) x-intercept: 2; y-intercept: -8
D) x-intercept: -2; y-intercept: -8

Solve and check the linear equation.

41) $-7x + 5 + 7(x + 1) = -5x - 7$

A) $\{\frac{9}{7}\}$

B) $\{-\frac{9}{5}\}$

C) $\{\frac{19}{7}\}$

D) $\{-\frac{19}{5}\}$

Solve the equation.

42) $\frac{2x}{5} = \frac{x}{3} + 3$

A) $\{-90\}$

B) $\{-45\}$

C) $\{90\}$

D) $\{45\}$

First, write the value(s) that make the denominator(s) zero. Then solve the equation.

43) $\frac{x-3}{2x} + 1 = \frac{x+9}{x}$

A) $x \neq 0; \{21\}$

B) No restrictions; $\{6\}$

C) $x \neq 0; \{-20\}$

D) $x \neq 0, 2; \{21\}$

Let x represent the number. Write the English phrase as an algebraic expression.

44) Twice the sum of a number and 5

A) $10 + x$

B) $5(x + 2)$

C) $2(x + 5)$

D) $2x + 5$

Solve the formula for the specified variable.

45) $F = \frac{9}{5}C + 32$ for C

A) $C = \frac{9}{5}(F - 32)$

B) $C = \frac{5}{9}(F - 32)$

C) $C = \frac{5}{F - 32}$

D) $C = \frac{F - 32}{9}$

Add or subtract as indicated and write the result in standard form.

46) $(6 + 9i) - (-3 + i)$

A) $9 - 8i$

B) $9 + 8i$

C) $-9 - 8i$

D) $3 + 10i$

Find the product and write the result in standard form.

47) $(3 + 3i)(2 - 5i)$

A) $-15i^2 - 9i + 6$

B) $21 - 9i$

C) $-9 + 21i$

D) $21 + 9i$

and express the result in standard form.

48) $\frac{-9 + 12i}{1 + 2i}$

A) $6 - 3i$

B) $3 - 6i$

C) $6 + 3i$

D) $3 + 6i$

perform the indicated operations and write the result in standard form.

49) $\sqrt{-49} + \sqrt{-64}$

A) $56i$

B) $15i$

C) $-15i$

D) -15

solve the equation by factoring.

50) $10x^2 + 31x + 15 = 0$

A) $\{-\frac{3}{5}, -\frac{5}{2}\}$

B) $\{\frac{3}{5}, -\frac{5}{2}\}$

C) $\{\frac{3}{5}, \frac{5}{2}\}$

D) $\{-\frac{3}{10}, -\frac{1}{3}\}$